

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 December 2003 (11.12.2003)

PCT

(10) International Publication Number
WO 03/101695 A2

(51) International Patent Classification⁷: **B28D 5/02**

(21) International Application Number: PCT/GB03/02303

(22) International Filing Date: 27 May 2003 (27.05.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0212775.1 31 May 2002 (31.05.2002) GB

(71) Applicant (for all designated States except US): **WEST-WIND AIR BEARINGS LTD** [GB/GB]; Holton Road, Holton Heath, Poole, Dorset BH16 6LN (GB).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **GERRARD, Christopher, Paul** [GB/GB]; 190 Salisbury Road, Burton, Christchurch, Dorset BH23 7JS (GB).

(74) Agents: **FAULKNER, Thomas, John et al.**; 11 Cleveland, 40-43 Chancery Lane, London WC2A 1JQ (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

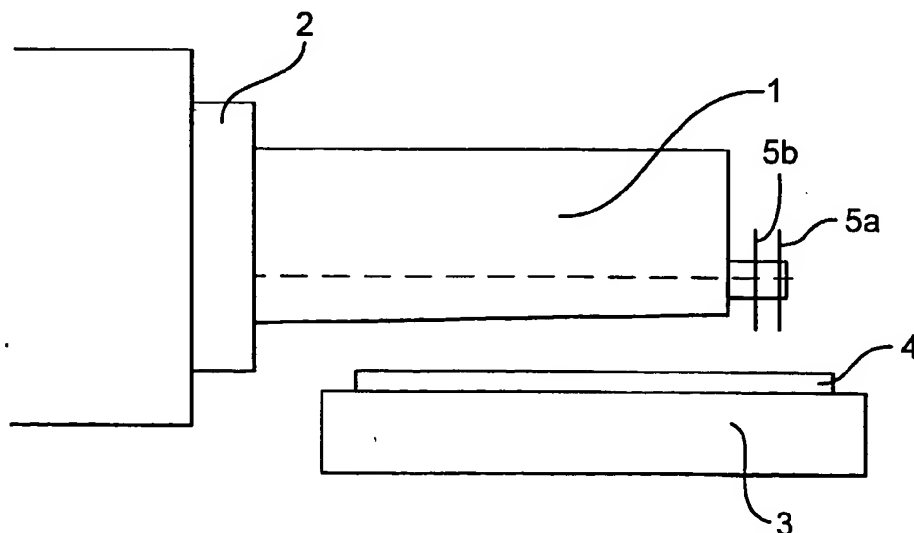
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MACHINING APPARATUS AND METHODS



(57) Abstract: A machining spindle comprising an inner shaft (110a) arranged for carrying a first tool (5a) for machining a work-piece and an outer shaft (110b) arranged for carrying a second tool (5b) for machining the workpiece, wherein the shafts are mounted one inside the other for rotation about a common axis and for axial movement relative to each other. The shafts are supported by air bearings. The spindle is particularly suited to dicing silicon wafers into oblong chips.

WO 03/101695 A2